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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/587,706

07/28/2006

Martin Muller

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04/27/2009

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EXAMINER

SAUCIER, SANDRA E

ART UNIT

PAPER NUMBER

1651

MAIL DATE

DELIVERY MODE

04/27/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/587,706

Applicant(s)

MULLER ET AL.

Examiner

Sandra Saucier

Art Unit

1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS-300)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 7/28/06

DETAILED ACTION

Claims 1–23 are pending. Claims 1–21 are considered on the merits. Claims 22, 23 are withdrawn from consideration as being drawn to a non-elected invention. The claims are examined to the extent of the elected species of the substrate, limonene and the product carvone.

Election/Restriction

Claims 22, 23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected, the requirement having been traversed in Paper No. 2/19/09.

The traversal is on the ground that search of all the species would not be burdensome. This is not found persuasive for at least because the species have distinct structures and require distinct searches. The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections – 35 USC § 112

WRITTEN DESCRIPTION

Claims 13, 14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Applicants claim the use of a reduced C content medium. However, the specification does not describe such a medium. On page 9, a medium according to Sprecher and Hansen [1982] is in the exemplification. However, a search of Biosis for publications by the author Sprecher in 1982 did not result in a publication being found. Thus, the written description fails to completely describe the medium used. This may also raise issues of the disclosure of best mode in the future.

INDEFINITE

Claims 1–22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention.

The claims have no active steps. Active steps have an active verb, i.e. rehydrating, mixing, transforming.

The term "flavor-active terpenes" and "terpene hydrocarbons" at least overlap and may be identical in scope. For example, applicants elected species of substrate, limonene, is both a "flavor-active" terpene and a terpene hydrocarbon. Also, terpenes are hydrocarbons, use of the term "hydrocarbon" does not further describe the compound. Also, terpenes such as limonene have flavor, in fact a synonym for limonene is "orange flavor", see EP 1 424 071 [1] paragraph (0022). Thus, the terms are indefinite and the metes and bounds of the claim cannot be understood.

Also, there does not appear to be a word "mycel" in the scientific English language. Please correct appropriately.

Claim 2 does not have an active step and it cannot be determined where in the process the ultrasonication occurs. especially since the ultrasound/extrusion step is not exemplified, merely "reduced to small pieces".

Claim 6 recites *Fusarium proliferatus*. There is no such fungi. Please correct.

Claim 10 recites that induction by substrate addition is carried out in the lyophilized mycel. However, in the example, the induction is not carried out in the mycel when in the lyophilized state. Careful attention to language would promote examination. Also, this claim as all the others is not in active language.

Claim 13 is indefinite because it does not define what the variable M is.

Claim 21 has two periods in it. Also, what is *Pleurotus spec.* If it is a

species of the genus *Pleurotus*, please so state.

Also, scientific convention uses italicized genus and species names. When redrafting the claims, please do so.

Claims 1–22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is a step of recovering of the product.

The claims are incomplete in the absence of a recovery step for the product produced. It is clear from the record and would be expected from conventional preparation processes that the product must be isolated or recovered. Thus, the claims fail to particularly point out and distinctly claim the ‘Complete’ process since the recovery step is missing from the claims. The metes and bounds of the claimed process are therefore not clearly established or delineated. The insertion of a recovery step also provides for a positive utility for the method.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action: (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1–19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onken *et al.* [4] in view of Sundari *et al.* [2] or the ATCC Catalog [U] and Taubert *et al.* [5].

The claims are interpreted to be directed to a process comprising: obtaining a lyophilized mycelium of ascomycetes, basidiomycetes or deuteromycetes rehydrating the lyophilized mycelium, contacting the rehydrated mycelium with a terpene hydrocarbon substrate (limonene) thereby converting the substrate to a flavor-active terpene (carveone or carvone).

The references are relied upon as explained below.

Onken *et al.* disclose the use of the substrate adapted basidiomycete, *Pleurotus sapidus*, in a submerged culture to transform the substrate R (+) limonene to carveone. The culture has been homogenized with an ultraturrax homogenizer. The transformation is carried out in a two phase system without the addition of solvents. The disclosure lacks the use of lyophilized basidiomycetes in the bioconversion.

Sundari *et al.* teach the lyophilization of mycelium of basidiomycete fungi including species of *Pleurotus*.

ATCC routinely lyophilizes fungi species of *Fusarium*.

Taubert *et al.* teach different disintegration method for filamentous fungi, Fig 1.

The substitution of rehydrated mycelium for the fresh mycelium of the prior reference would have been obvious because vegetative mycelium has been lyophilized as taught by ATCC Catalog or Sundari *et al.* Also, once the mycelium is rehydrated, it is indistinguishable from fresh mycelium. Therefore, if one of skill in the art wishes to freeze-dry and then rehydrate mycelium prior to use in a biotransformation method, this is well within the purview of one of ordinary skill in the art. Also, since the example does not incorporate the use of a sonicating step, merely stating that the rehydrated mycelium "was reduced to small pieces", the use of an Ultra-Turrax homogenizer is considered to be the equivalent of sonication/extrusion because use of an Ultra-Turrex

homogenizer is also a disintegration method which reduces mycelium into small pieces according to Taubert *et al.*, Fig. 1.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onken *et al.* [4] in view of Sundari *et al.* [2] or the ATCC Catalog [U] as applied to claims 1-19, 21 above, and further in view of Kaspera *et al.* [V].

The claim is further directed to the use of a *Fusarium* species to convert (R)-(+)-limonene to cis-(+)-carveol.

Kaspera *et al.* teach that *Fusarium proliferatum* converts (R)-limonene to cis-(+)-carveol. The reference also teaches that *Pleurotus sapidus* converts either S or R limonene to R-(+) and S-(-)-carvone.

The substitution of a species of *Fusarium* for the species of *Pleurotus* in the method of Onken *et al.* would have been obvious because it is known that a species of *Fusarium* converts (R)-(+)-limonene to cis-(+)-carveol.

One of ordinary skill in the art would have been motivated at the time of invention to make these substitutions in order to obtain the resulting compound as suggested by the references with a reasonable expectation of success. The claimed subject matter fails to patentably distinguish over the state of the art as represented by the cited references. Therefore, the claims are properly rejected under 35 U.S.C. § 103.

All elements are taught in the prior art. No claim is allowed.

Conclusion

Applicant should specifically point out the support for any amendments made to the disclosure, including the claims (MPEP 714.02 and 2163.06). It is applicants' burden to indicate how amendments are supported by the ORIGINAL disclosure. Due to the procedure outlined in MPEP 2163.06 for interpreting claims, it is noted that other art may be applicable under 35 USC 102 or 35 USC

103(a) once the aforementioned issue(s) is/are addressed.

Applicant is requested to provide a list of all copending applications that set forth similar subject matter to the present claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sandra Saucier whose telephone number is (571) 272-0922. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, M. Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sandra Saucier/
Primary Examiner
Art Unit 1651